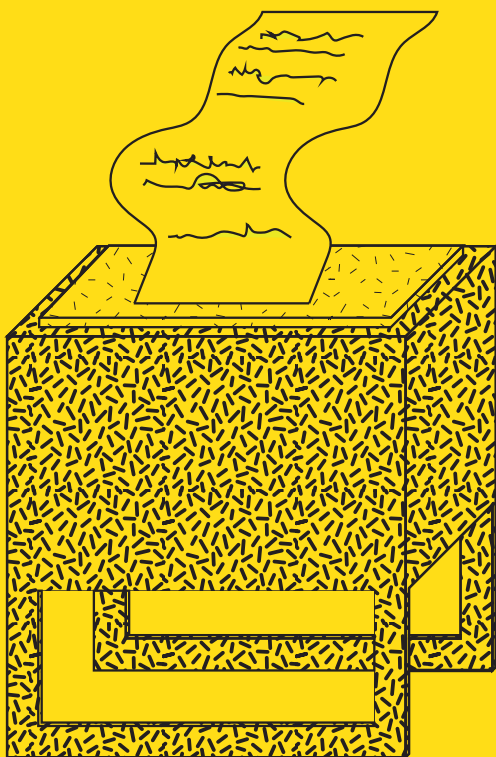


TapWriters

Connecting the High Street through
Internet-connected objects



TapWriters

Connecting the High Street through
Internet-connected objects

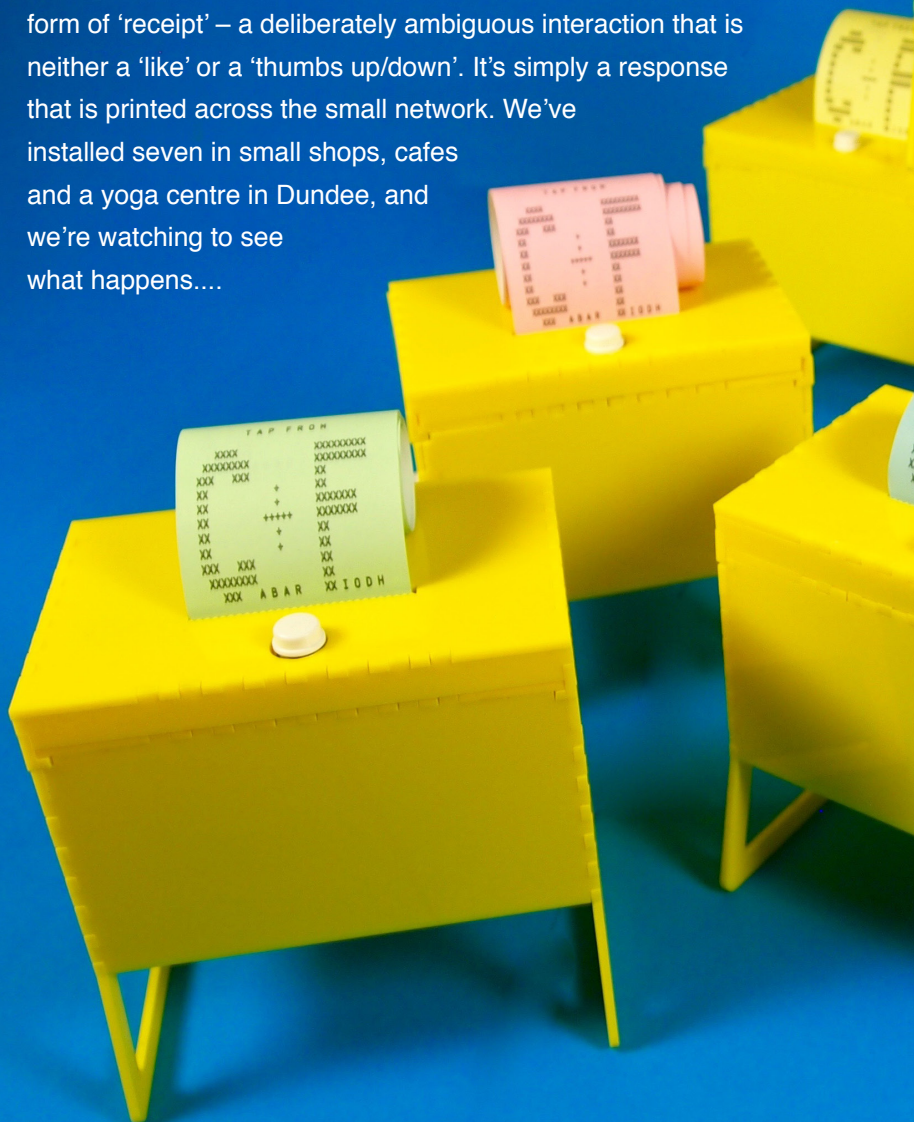
Designers

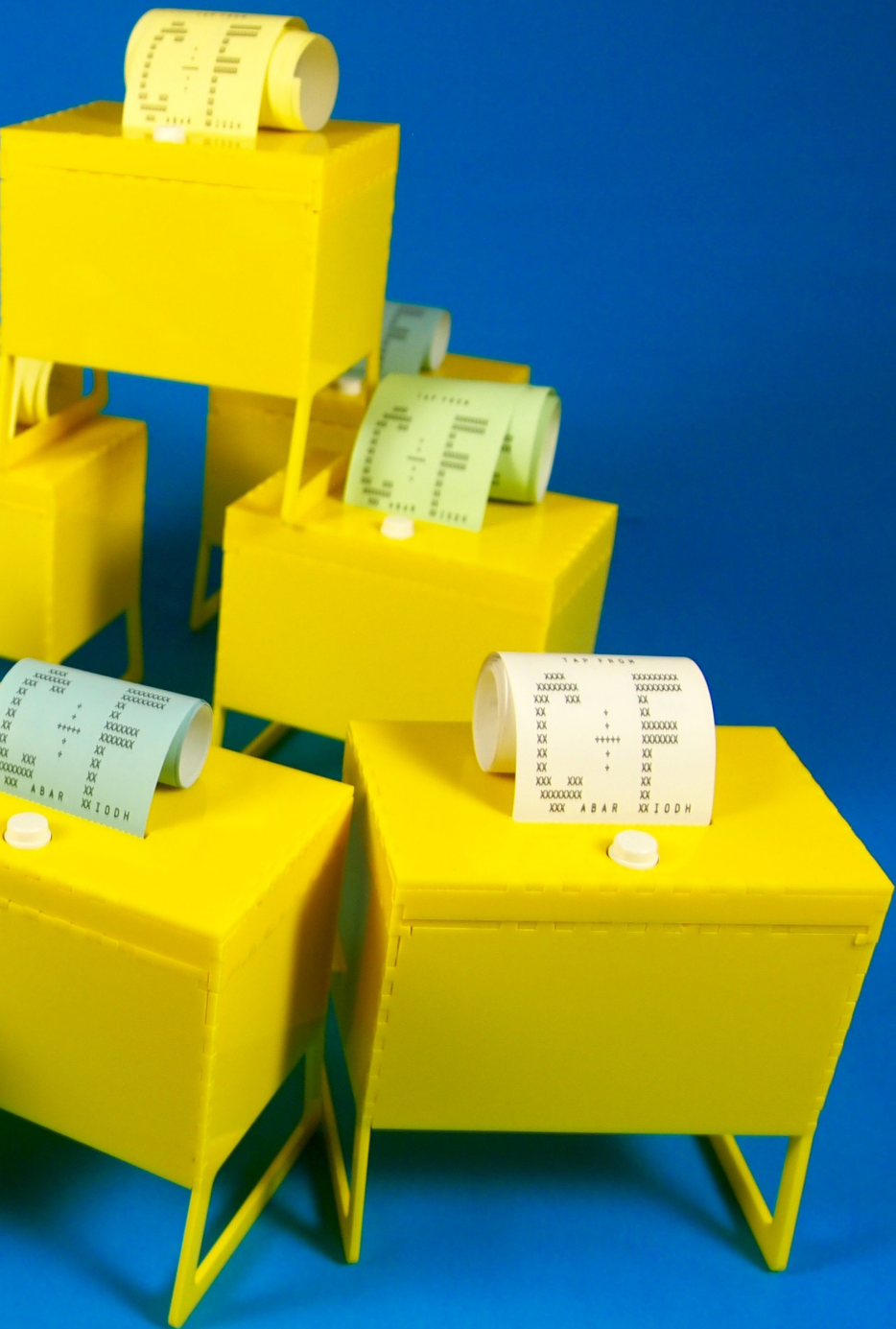
Michael Shorter, Dr Jon Rogers and Dr
Jayne Wallace

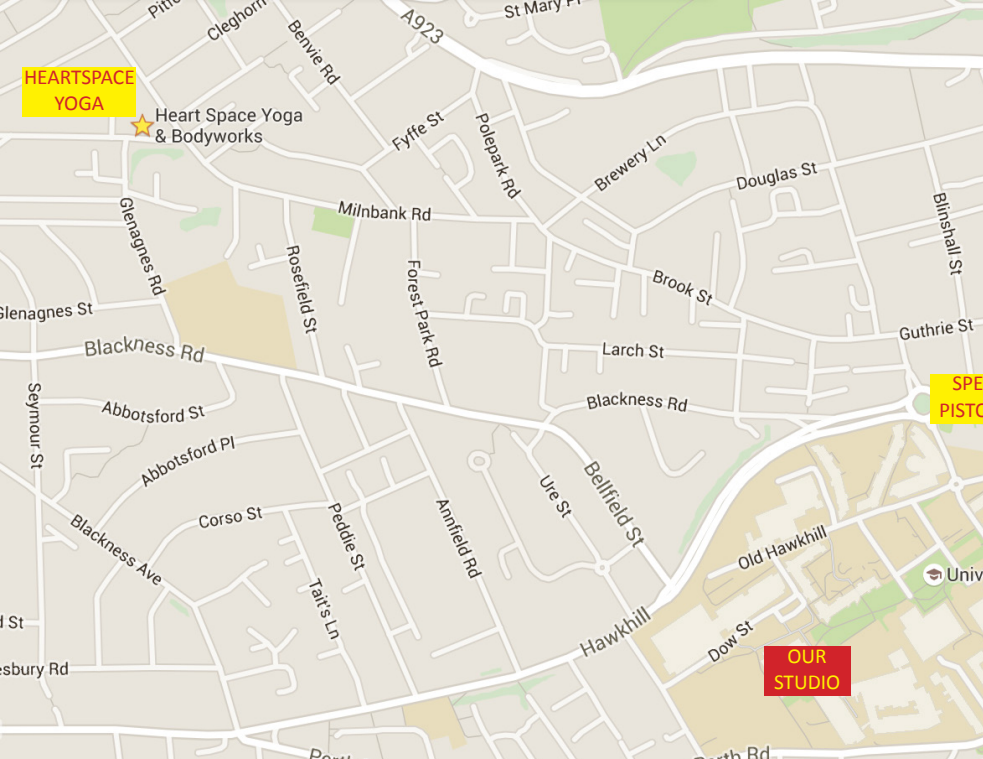
A Collaboration between the University
of Dundee, Northumbria University and
the University of Edinburgh.

This work is funded by the EPSRC

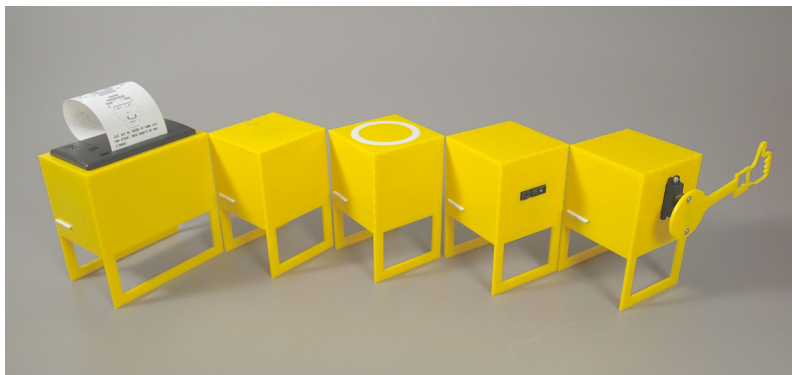
We have built the world's smallest social network. It's a network of small till-roll printers that are connected to the web powered by the amazing Electric Imp. We're calling them TapWriters. You tap at a screen and it comes out on paper – on all of the rolls at the same time. It's changing a printer from a printing appliance into a social media device. This limits resources. We've created a social feedback mechanism by having a single button that you tap as a form of 'receipt' – a deliberately ambiguous interaction that is neither a 'like' or a 'thumbs up/down'. It's simply a response that is printed across the small network. We've installed seven in small shops, cafes and a yoga centre in Dundee, and we're watching to see what happens....







This project was born from a meeting with local shops in Dundee. We wanted to gather local business owners together to discuss how the Internet of Things could benefit both their business and their community. To help the shops get their heads around the IoT we wanted to show them basic demonstrators of what the IoT is and what it can do, these are pictured below.





Five demonstrators were created and housed in little yellow boxes, this made them visually look like they were all part of the same project. We invited many local shop owners and business people to a meeting about the project in the Folk Cafe in Dundee - their location can be viewed above and over the next few pages. At this meeting we discussed the IoT, showed them the demonstrators and told them we wanted to build some cool stuff for them. One of the key stories we told them was of the connectedness in Indian Chowks and other shopping contexts that we had encountered and how we wanted to bring this to the Dundee High Street.

Most of the shopkeepers were chiefly taken by the receipt printer demonstrator. They could all instantly see useful applications for this. In order to make something quickly for them to live with and that could act as a stimulus for further discussion and design opportunities the team got to work sketching out some ideas around these printers. Several designs were very specific for individual shops and others more focussed on connecting all the shops together.











PEOPLE KNOW HIS
CHARACTER + KNOW HE
WILL BE ABLE TO FIND
IT FOR HIM.

1 MINUTE
OF EYE
CONTACT.



GET TO KNOW
YOUR LOCAL
SHOP KEEPER!



ETC
POSTED
PORTRAITS
OF CUSTOMERS.

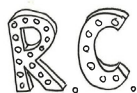


* RHYTHMIC
* DIMMING
* PROJECTIONS



PUSHING SKILLS + PRODUCTS ON
INSTAGRAM + FACEBOOK.

MIRRORS



SWIPE + WATCH
SOMETHING.

WHAT CEREALS USE MY
GLASSES?

HISTORY OF OBJECTS
FUTURE OF OBJECTS.

THEMES FROM CONNECTED CONVERSATIONS #1

COMMUNICATION BETWEEN:

STAFF → STAFF
STAFF → CUSTOMERS
CUSTOMERS → STAFF
CUSTOMERS → CUSTOMERS.

CONNECTING SERVICES + PRODUCE FROM SHOPS.

SOMETHING TO DO WITH GERRIES.



ORDERING ONLINE
UP PARTICIPATION.

SPEXPISTOLS

CH-CHUG

I WANT TO
LOOK LIKE MURDER.

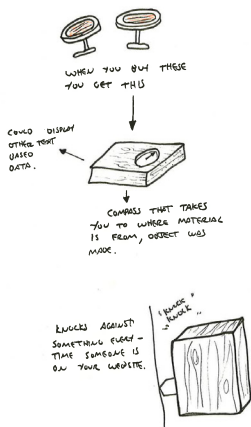


PHOTO THERMAL
PRINTER.



IT'S A
SPECTACLE

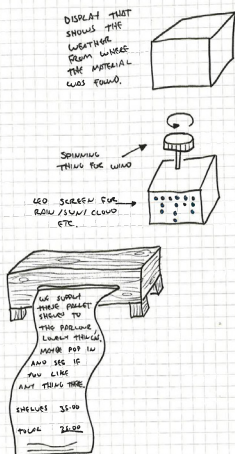




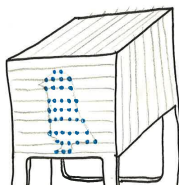
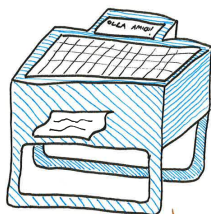
80



81



82



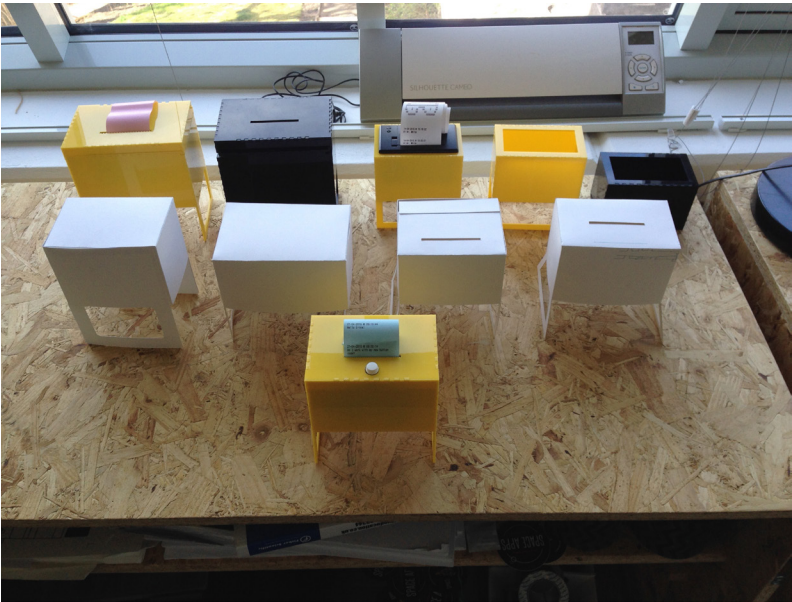
TapWriters

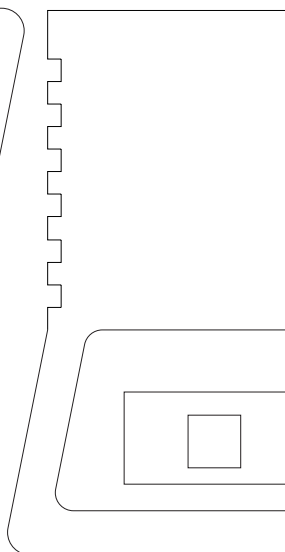
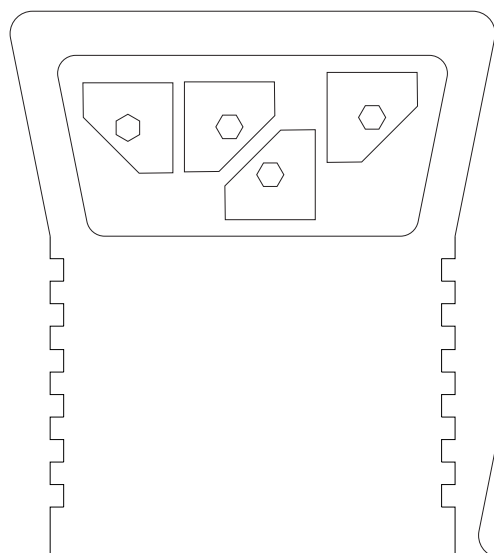
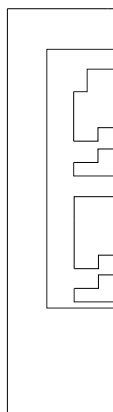
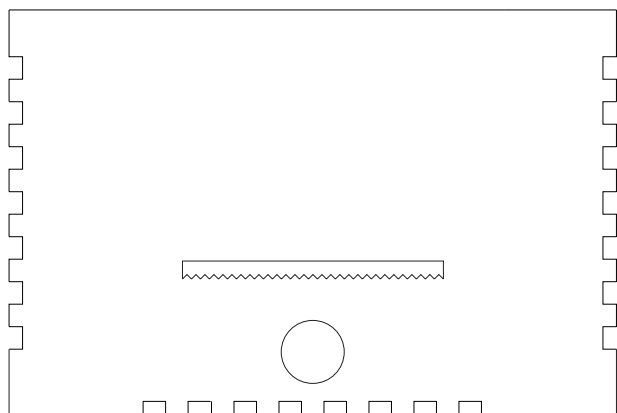
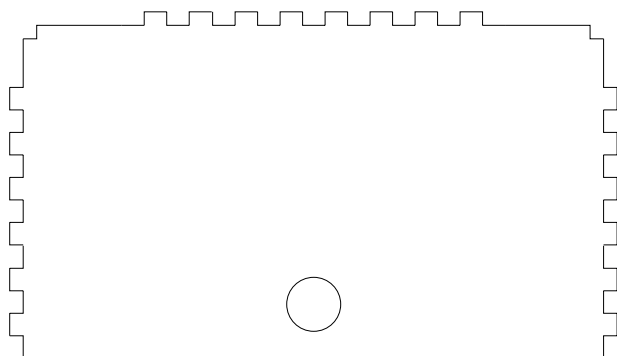
The TapWriter. The TapWriter was not an answer to a problem but more of a question in itself. We wanted to create a simple IoT device for each shop as a way to draw the shopkeepers into a rich discussion around what kinds of IoT would benefit their ways of working, selling and creating an experiential environment through their businesses. Our rationale was that if they lived with a device they would be in an informed position to critique it and to better envisage what kinds of device could enrich their shops. The Tapwriter was designed with no particular purpose, we wanted the shopkeepers to figure this out for themselves.

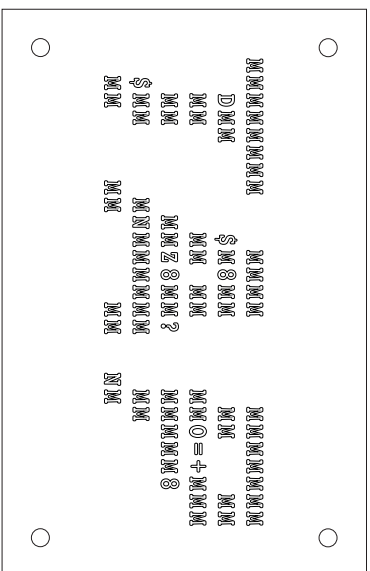
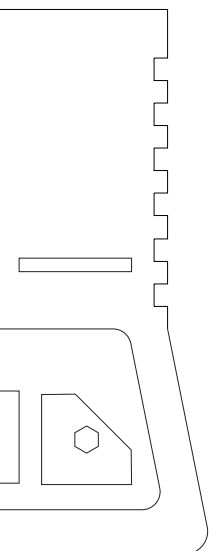
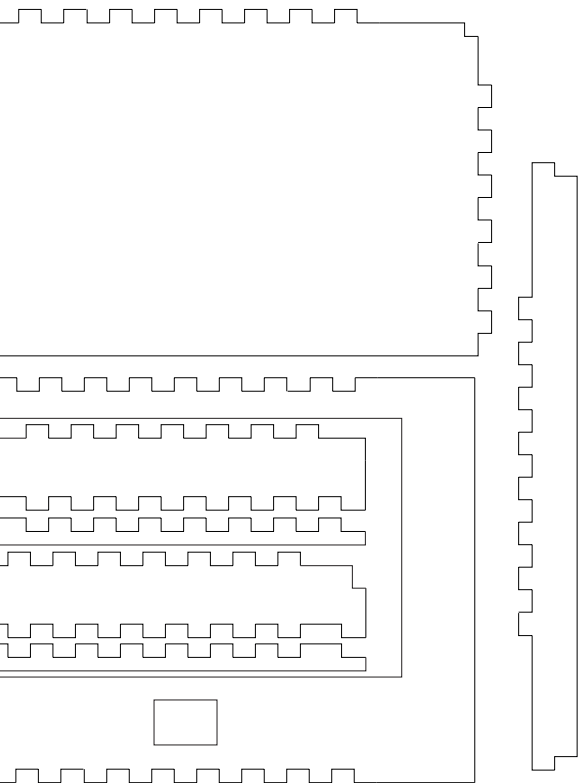
The TapWriter is an internet connected thermal printer that has two input functions. Firstly messages can be typed online at www.tapwriter.net - when sent the message prints out anonymously on all of the printers including your own. If the shopkeeper did not have time to type something on a website they could just press the button, or 'tap' as we call it, on the object itself. By 'tapping' a shop logo prints out on all the printers in ASCII form.

Digitally only the last 100 messages are logged - meaning that as new messages are created by shop owners older ones are deleted from the log. The only complete records of all messages sent are the physical till rolls that emerge from the tapwriters themselves, which show all of the conversations.

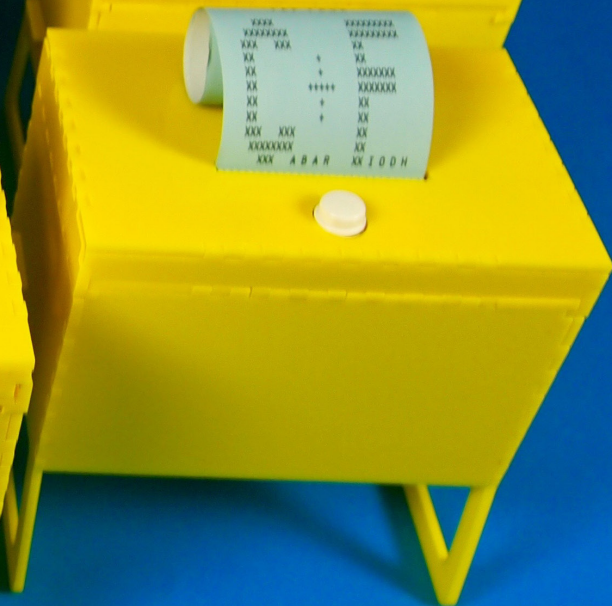
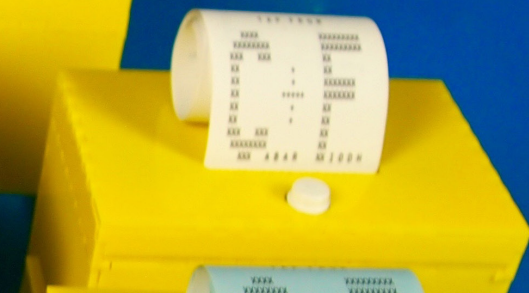
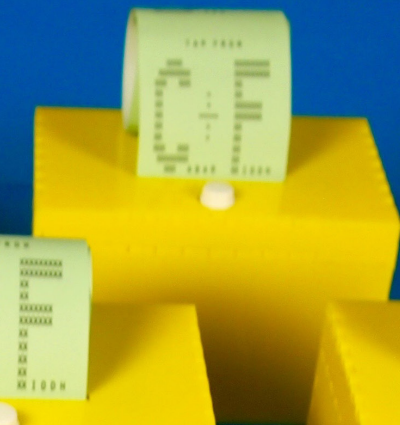
In terms of design we initially wanted the printers to be customisable for each shop. We created a removable lid that could be remade from something more meaningful for each shop. The image on the left illustrates some of the customising options we explored. Below is a screen shot from the original web interface. The next spread of pages contains the laser cutter file used to produce the final TapWriter design.

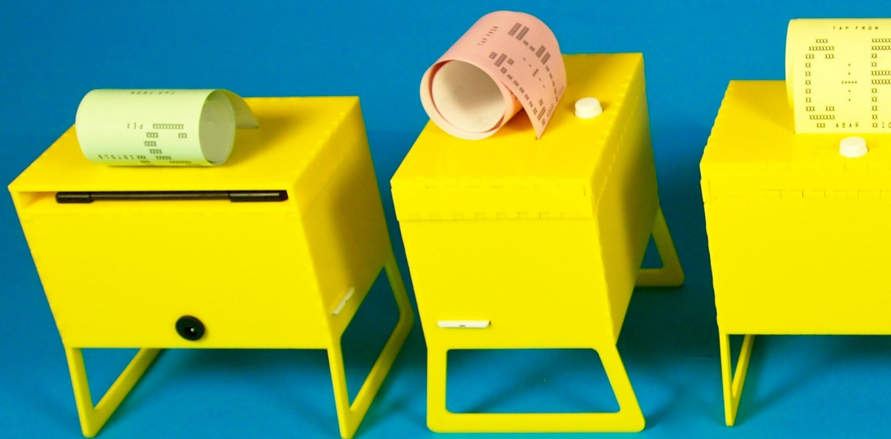










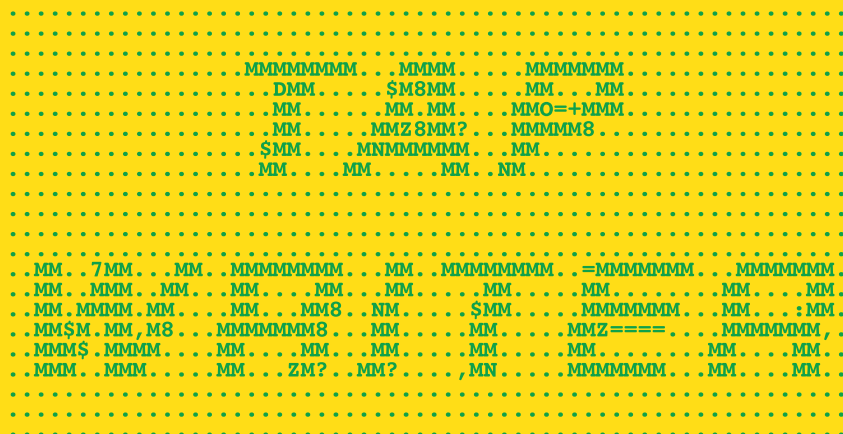


We decided that we wanted to create another network of shops. We had an opportunity to install the TapWriters in Mexico City. The locations for these Mexico TapWriters were:
XXXXXXXXXXXXXXXXXXXXXXXXXXXX.

Before Mexico the network in Dundee was, in our opinion, a good size - i.e. less than 10. We reasoned that a greater volume could lead to a large amount of anonymous messages being printed out, which may have been overwhelming, not to mention the sheer amount of till rolls needed to maintain a larger network.



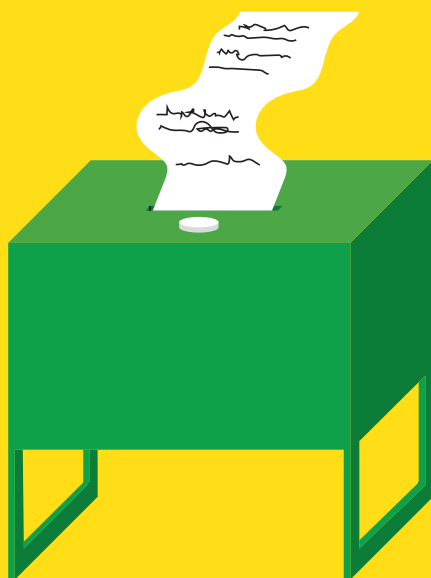
We created a new web interface with the help of Tim Brooke and Paul Hamilton from Future Cities Catapult in London. This new web interface allowed messages to be sent to Dundee, or to Mexico City or even both cities simultaneously. There was a bit of a language barrier to overcome if the messages were to be sent to both countries. A Google translate function was built into the interface enabling each message to be sent in both English and Spanish. N.B. The messages would print out in both languages.



Tap Writer es una pequeña red social en Internet que conecta entre sí las impresoras de diversas tiendas de la Ciudad de México. Tiene dos funciones: puedes mandar un mensaje de texto por www.tapwriter.mx o puedes enviar un 'tap.' Este último se envía haciendo click en el botón tap y la aplicación mandará el logo de la tienda donde tú estás a todas las otras tiendas en la red.

Los mensajes enviados a cada tienda son anónimos.

Si tienes alguna duda o problema, por favor, ponte en contacto con Jon Rogers al teléfono 0044 7885 673826 o al correo electrónico j.rogers@dundee.ac.uk



t a p w r i t e r . n e t

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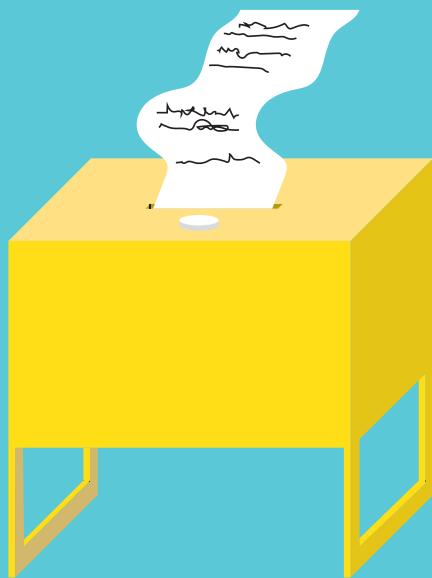
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.....MM000000M.....M000M.....M000000M.....
.....MMM.....5M5MM.....MM.....MM.....
.....MM.....MM.....MM.....MM0=+100M.....
.....MM.....MMZ8MM?.....M0000M8.....
.....5MM.....MM000000MM.....MM.....
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.....MM.....M000M.....MM.....MM.....MM8.....MM.....5MM.....M000000M.....MM.....;MM.....
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.....M00M5.....M00M.....MM.....MM.....MM.....MM.....MM.....MM.....MM.....MM.....
.....MM.....M00M.....MM.....ZM?.....MM?.....MM.....M000000M.....MM.....MM.....
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Tap Writer is a tiny social network of internet connected printers for shops in Dundee. There are two functions; you can either send a text message via www.tapwriter.net, or you can send a tap. Send a tap by tapping the button; it will send a logo of the shop you are in to all the other shops.

Every message sends to every shop and is anonymous.

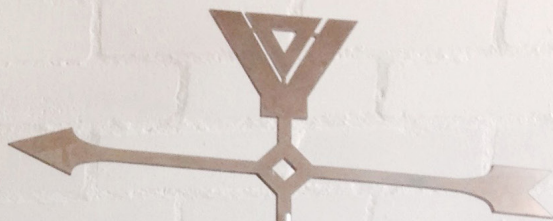
If you have any queries or issues please contact Mike Shorter on 07821054433 or at mail@mrshorter.co.uk



tapwriter.net

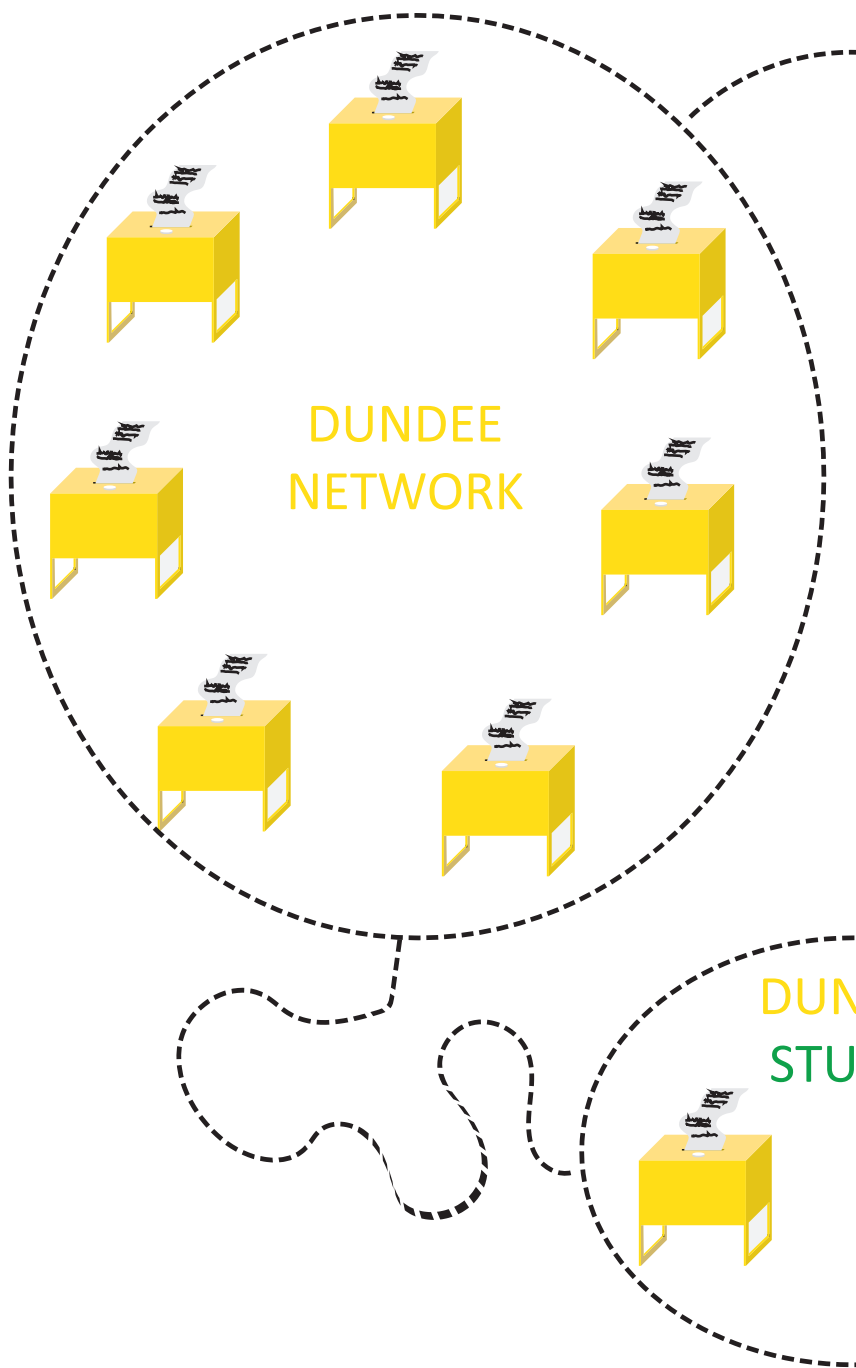
Testing the Mexico City network before packing them up for their long haul flight. We decided that eight was the ideal number of printers per network. There is something nice about calling them 8 bit networks.

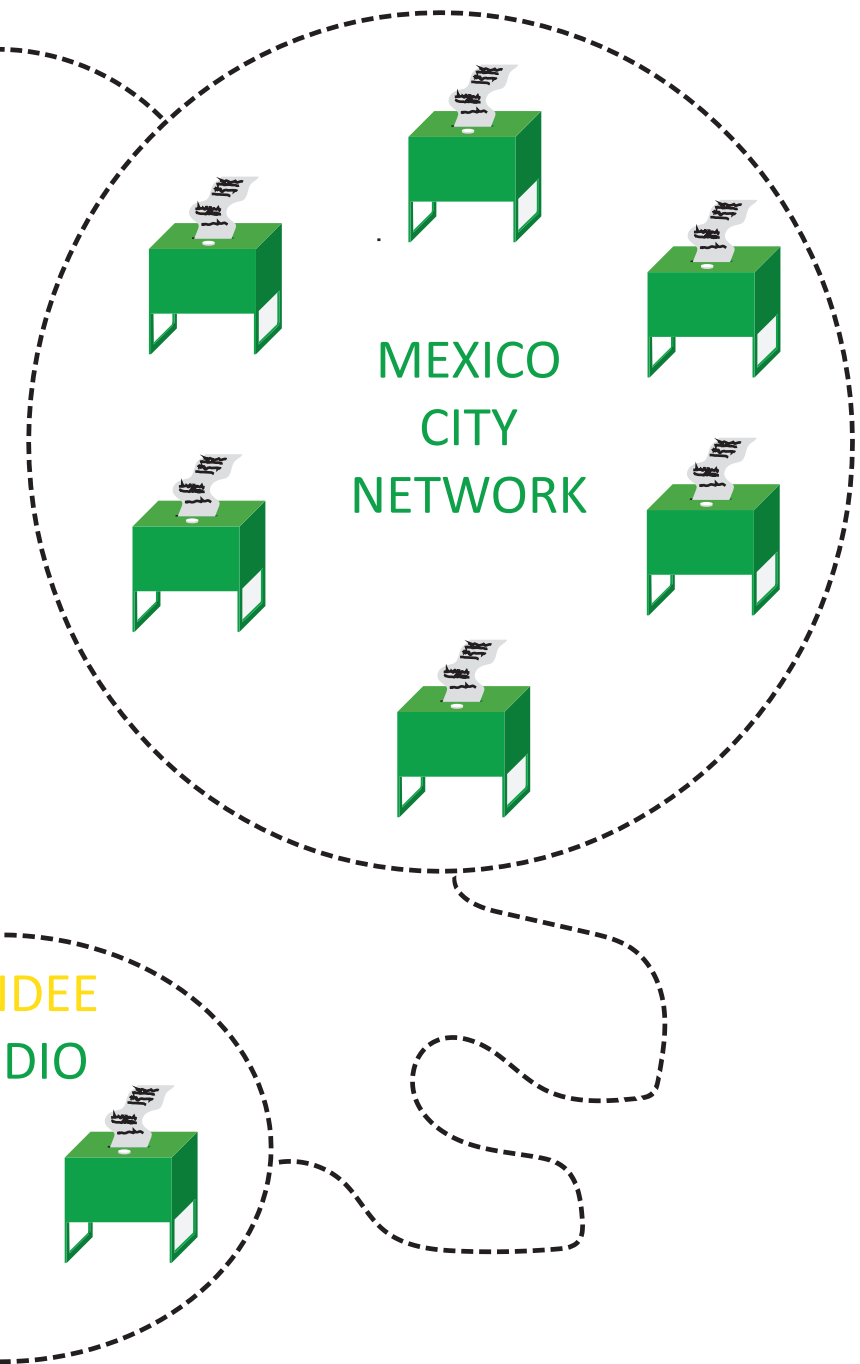


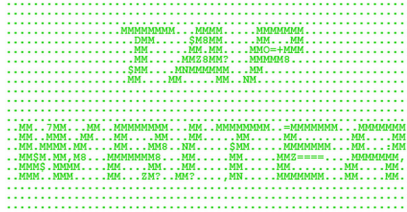


BESPOKE









Tap algo...

Enviar a las tiendas



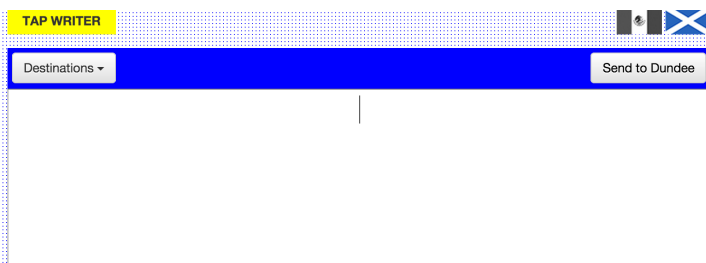
Tap something...

Send to Shops

Both the Dundee and Mexico City network had a TapWriter based in the Dundee Studio. This meant that we could keep an eye on what was going on as well as keep a physical log of messages being sent.

The screen shots on the left are the two initial web interfaces for both the Dundee and Mexico City Network. Below is the combined web interface that has the built in Google Translate function as well as the drop down menu to say where you want your message to be sent to.

This new web interface also displayed the message differently before sending. Before the message was displayed on one continuous line, this was fine but we wanted the users to be able to be a bit more creative with their content. The new interface displayed the message as it would be shown on the receipt paper, this allowed for ASCII art to be created easily.



The screenshot shows a web interface titled "TAP WRITER" in a yellow box at the top left. In the top right corner, there are three small icons: a black square, a white square, and a blue square with a white saltire (Scottish flag). Below the title bar is a blue header area containing a "Destinations" dropdown menu on the left and a "Send to Dundee" button on the right. The main body of the interface is a large white rectangular area with a thin vertical line down the center, intended for displaying messages in a receipt-like format.



Insights and Future Development

Examples of early uses of the Dundee TapWriters:

Ordering Food - Richard at Spex Pistols would send messages to the Parlour Cafe to tell them what he wanted for breakfast so they could have it ready for when he went over to pay. He also asked them to 'surprise him' and to prepare him a mix of what they recommended that day.

Discussing stock - Cabar & Fiodh and Lovely Things would discuss and announce what stock they each had.

Sending discount vouchers - Lovely Things would send out batches of discount vouchers to other shops offering deals on candles and other goods. Interestingly Lovely Things created special deal vouchers for the other shops to give to 'their favourite customers that day' as well as general ones for anyone. Heartspace Yoga also offered free yoga sessions via the TapWriters.

Discussing politics - During the recent 2015 General Election some shops would anonymously send out their own political rants about campaigns.

Sending jokes - There has been a lot of light comments being made over the TapWriters and attempts to make each other laugh. Knock knock jokes have been used a great deal, other examples include messages of 'morning you beautiful people' and everyone saying good night to each other.

Sending song lyrics/poetry - This is network anonymous but by knowing Richard from Spex Pistols love for Johnny Marr I have a suspicion who all the Smiths song lyrics are coming from...

'Taps' are very popular - Every time someone taps there will be burst of them hot on its heels. This turns out to be a very simple and easy way of letting people know they are out there.



Requested features:

ASCII art - the users wanted the ability to send photos through an ASCII art filter.

Direct Messaging/blocking - Sometimes the users just wanted to send a message to a specific person. There were users who would send a lot of messages, some users suggested that they may want to block these people.

Who is it for - There was a slight confusion as to where to keep the device in their shops as some of the messages were directed to the shop keeper and some to the shops customers. There was talk of building some sort of pin board to display the messages.

The interconnections and relationships between Dundee and Mexico City still need to be analysed and users asked questions about this.

Can we make a social network? For real...

*A reflective blog post by Jon Rogers taken from
www.productresearch.dundee.ac.uk*

It is 6am and I've woken up a little early. The sun does funny things in Scotland. It doesn't get hot like the most of the rest of the world and while it forgets to get up in the winter, it forgets to go to go down in the summer. So it's been light for a few hours... And I started to think about this: What is a social network? I'm asking this question because I'm going to build one or rather I've started to build one and now I want to tell people about it. Building social networks is something I've been doing all my life in the real world – as have you. At some point in the mid to late 1970s in the blistering heat (15C) of a long hot summer my best friend in the whole world, Toby, and I became 'blood brothers'. I think we struggled a little with pricking our fingers to actually get blood, but we knew that the blood marked the friendship of the highest kind. We formed a network from the exchange in blood. Or at least, we formed a bond over the idea that we could exchange blood. That exchange marked us as special. We were a new form of kin.

Some forty years later at the very moment I'm writing this post, I have on my twitter account around one thousand five hundred and twenty five 'followers'. That's seems a lot – particularly as before twitter being followed was either a little creepy, or marked you out as having a particularly special relationship with a god.. my this one and a half thousand followers is nothing like Katy Perry who has seventy million followers. SEVENTY MILLION. That's, like, nearly ten times the number of people who watched the Doctor Who Christmas special! How does someone do this? For me I have no idea who all but twenty five of my followers are but I imagine they are sitting there waiting with baited breath on my every 140 chars that comes through my fingers onto the screen. ... And that's just twitter -what about facebook?

Real Madrid footballer Cristiano Ronaldo has overtaken Shakira to become the most followed person on Facebook.

Said the BBC in March 2015, as apparently the footballer Ronaldo has over one hundred million likes. That's a LOT of likes. I'm not sure I've liked that many things in the world in my forty four years of existence – and I like a lot of stuff (marmite, beer from barrels, fish in batter, swimming in the north sea, The Tiger That Came To Tea, France and the colour coding on resistors – beach towels with colour codes from resistors would be AMAZING.. but I digress, sorry).

But what does having that many people follow or like you really mean? For toby and I, long before the web or of having heard of social networks, at a time when a friend was invited to your birthday party and a like was something less than a love, our network of two was sealed in an ancient bond that could never be broken. At least until we went to different universities, got jobs, got married, moved countries and had kids...But I've not become a blood brother with anyone since and that's quite an amazing thing.

That physicality and cultural significance of an (albeit interpretation) ancient ritual made our friendship special. Blood is a precious limited resource and only one person got to be my blood brother.

The web has enabled us to escape the limitations of the physical world. Friending someone or liking something is all very easy. There's no contract. No precious resource. No end. No friction. It's all so very easy. But it all feels a little bit hollow. Sometime in the late 1980s I shouted "all back to mine" in the local pub when my parents were on holiday. I was seventeen and it was more than a bit scary having most of the village of Benson (population 4,000) walk the one mile to my parents' house at midnight. I didn't know anyone so I mostly hid upstairs and waited for them to leave. It was dawn

when they did and I spent the rest of the day clearing up and realised that cigarette burns were hard to cover up... That the house was broken and that I was pretty much doomed. What would happen if Ronaldo did the same? All back to my facebook page for an after hours party? Would there be any mess to clear up? Would anything happen? Would it be any point? Would it create any difference in the real world – the world that Ronaldo and his one hundred million likes occupy? My point being is that physical social networks are very very different to digital ones. Duh! Of course they are I hear you scream. Yet you say this, but most of what we're doing with IoT technology is building one thing that can connect to the web. Rather than building networks that are powered by and ARE the web, we're simply adding dead nodes to an existing system. My call to action is to design entirely new forms of physical networks that are a part of, and not an aside to, the web.

Have you thought of building your own bridge between these worlds. Could we make physical/digital social networks that the Internet of Things (or the web with things as I continue to call it) technology can enable? I don't think that connecting household appliances to the web is particularly social, exciting or interesting – do you?

So why not build our own physical social network. Which we've done. Or at least we've started to do. And I'll share this with you here.

We have built the world's smallest social network. It's a network of small till-roll printers that are connected to the web powered by the amazing Electric Imp. We're calling them Tap Writers. Because you tap at a screen and it comes out on paper – on all of the rolls at the same time. It's changing a printer from a printing appliance into a social media device – where paper is the media rather than Facebook's or Twitter's screen. This limits resources (Katy Perry and Ronaldo would run out of paper pretty quickly if they had this network). We've created a social feedback mechanism by having a single button

that you tap as a form of 'receipt' – a deliberately ambiguous interaction that is neither a 'like' or a 'thumbs up/down'. It's simply a response that is printed across the small network. We've installed seven in small shops, cafes and a yoga centre in Dundee. And we're watching to see what happens. We want eight in a network and are looking for the next place in Dundee to join.

So how does it work? Mike's been playing with the till rolls connecting to Imp using a bit of code from instructables. An amazingly powerful feature of Imp is that it handles Http messaging and it's super straight forward to have all of the printers connected in a network. So this is great technically. Yet the thing that got me most excited is the scalability that Imp provides. With so few components in the TapWriters and the cost and scalable tools Imp has for mass production, we're almost ready to go live with a product... a physical social network that connects people through paper.....

It's quite exciting to have a social network. Next up we want to take it international so we're heading to Mexico City to install another eight there with a Spanish translation built in. So watch this space as this early trial has made me decide that we need to further this and we need to look at how we can design for physical, human and real networks – that are limited by resource and therefore force us to make choices about who we want in our network and what and when we say things. They do I think take the Internet of Things into a much more social space that I'm calling the Web With Things. Want to take part in this experience? Get in touch – we'd love to talk to you about what we're doing. Over the next twelve months we're going to further this and build a number of physical social networks to find out if we can do this and what it will be like. We'll share the results as we go and let's see where this takes us... I promise if you join us I won't be asking for any of your blood but I might be asking you to get physical with a few of your friends.

Notes

